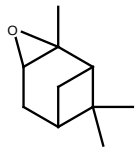
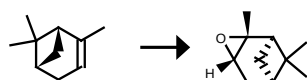


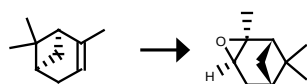
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	Query	Results	Date
1. Query	 Search as: Product, As drawn, No salts, No mixtures	63 reactions	2012-02-09 07h:04m:39s (EST)


 Rx-ID: 278291 [View in Reaxys](#) 1/63

Yield	Conditions & References
98 %	With dihydrogen peroxide, microencapsulated polystyrene 2 percent cross-linked, methyltrioxorhenium (VII) in dichloromethane, water, acetonitrile, Time= 1.5h, T= 25 °C Saladino, Raffaele; Neri, Veronica; Pelliccia, Anna Rita; Mincione, Enrico; Tetrahedron; vol. 59; nb. 37; (2003); p. 7403 - 7408 View in Reaxys
95 %	With 3,3-dimethyldioxirane in dichloromethane, acetone, Time= 2h, T= -5 - 0 °C Asouti, Amalia; Hadjirapoglou, Lazaros P.; Synlett; nb. 12; (2001); p. 1847 - 1850 View in Reaxys
91 %	With NaBO₃·4H₂O, sodium dehydrocholate, acetonitrile in water, Time= 18h, T= 20 °C Bortolini, Olga; Fantin, Giancarlo; Fogagnolo, Marco; Synthesis; nb. 7; (2009); p. 1123 - 1126; Art.No: T18608SS View in Reaxys
90 %	With pyridine, dihydrogen peroxide, methyltrioxorhenium (VII) in dichloromethane, water, Time= 2.5h, T= 19.85 °C Villa de P., Aida L.; Vos, Dirk E. De; Montes de C., Consuelo; Jacobs, Pierre A.; Tetrahedron Letters; vol. 39; nb. 46; (1998); p. 8521 - 8524 View in Reaxys
90 %	With sodium hydrogencarbonate, 3-chloro-benzenecarboperoxoic acid in dichloromethane Lakshmi, Rajamma; Bateman, T. David; McIntosh, Matthias C.; Journal of Organic Chemistry; vol. 70; nb. 13; (2005); p. 5313 - 5315 View in Reaxys
78 %	With peracetic acid, tetrasodium ethylenediaminetetraacetate, sodium carbonate, acetic acid in toluene, Ambient temperature Chapuis, Christian; Brauchli, Robert; Helvetica Chimica Acta; vol. 75; nb. 5; (1992); p. 1527 - 1546 View in Reaxys
	With meta-chloroperoxybenzoic acid, chloroform Delaby; Billuart; Bulletin de la Societe Chimique de France; vol. <5> 10; (1943); p. 567,572 View in Reaxys
	With meta-chloroperoxybenzoic acid, diethyl ether Kergomard; Geneix; Bulletin de la Societe Chimique de France; (1958); p. 394 View in Reaxys
	With monoperoxyphthalic acid Lombard; Heywang; Bulletin de la Societe Chimique de France; (1954); p. 1210,1212, 1214 View in Reaxys
	With peracetic acid, sodium acetate in dichloromethane, T= 0 - 20 °C Castro, Juan M.; Linares-Palomino, Pablo J.; Salido, Sofia; Altarejos, Joaquin; Nogueras, Manuel; Sanchez, Adolfo; Tetrahedron; vol. 61; nb. 47; (2005); p. 11192 - 11203 View in Reaxys
87 %Chromat.	With Na₂WO₄·2H₂O, phenyl-phosphonic acid, dihydrogen peroxide, [Me(n-C₈H₁₇)₃N]HSO₄, sodium hydroxide in water, Time= 12h, T= 25 °C

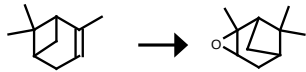
Kon, Yoshihiro; Hachiya, Houjin; Ono, Yutaka; Matsumoto, Tomohiro; Sato, Kazuhiko; Synthesis; nb. 7; (2011); p. 1092 - 1098
[View in Reaxys](#)



Rx-ID: 303048 [View in Reaxys](#) 2/63

Yield	Conditions & References
98 %	With dihydrogen peroxide, (trans-1,2-diaminocyclohexane)methyltrioxorhenium in dichloromethane, water, acetone, Time= 1h, T= -10 °C Saladino, Raffaele; Andreoni, Alessia; Neri, Veronica; Crestini, Claudia; Tetrahedron; vol. 61; nb. 5; (2005); p. 1069 - 1076 View in Reaxys
93 %	With 3-chloro-benzenecarboxylic acid in dichloromethane, T= 0 °C Lavallee, Pierre; Bouthillier, Gilles; Journal of Organic Chemistry; vol. 51; nb. 8; (1986); p. 1362 - 1365 View in Reaxys
92 %	With 3,3-dimethyldioxirane in dichloromethane, acetone, Time= 2h, T= -5 - 0 °C Asouti, Amalia; Hadjarapoglou, Lazaros P.; Synlett; nb. 12; (2001); p. 1847 - 1850 View in Reaxys
85 %	With meta-chloroperoxybenzoic acid, sodium carbonate in dichloromethane, benzene, T= -5 - 0 °C Krishna, R. R.; Chawla, H. P. S.; Dev, Sukh; Indian Journal of Chemistry, Section B: Organic Chemistry Including Medicinal Chemistry; vol. 23; nb. 12; (1984); p. 1190 - 1196 View in Reaxys
52 %	With pyridine, sodium hypochlorite, N-dodecyl-N-benzyl-N,N-dimethylammonium chloride, TPPMnOAc in dichloromethane, Time= 4h, Ambient temperature Carvalho, Maria-Eliza De; Meunier, Bernard; Tetrahedron Letters; vol. 24; nb. 34; (1983); p. 3621 - 3624 View in Reaxys
	With meta-chloroperoxybenzoic acid, chloroform Ritter; Russell; Journal of the American Chemical Society; vol. 58; (1936); p. 291 View in Reaxys Delaby; Billuart; Bulletin de la Societe Chimique de France; vol. <5> 10; (1943); p. 567,572 View in Reaxys Suzuki et al.; Tetrahedron; vol. 23; (1967); p. 3621,3628 View in Reaxys
	With 2,4,6-trimethyl-pyridine, sodium hydroxide, dihydrogen peroxide, 1-(toluene-p-sulphonyl)imidazole in methanol, T= 20 °C Kluge, R.; Schulc, M.; Liebsh, S.; Tetrahedron; vol. 52; nb. 16; (1996); p. 5773 - 5782 View in Reaxys
	With oxygen, isobutyraldehyde, [RuCl(TAZO)(p-cymene)] in dichloromethane, Time= 0.5h, T= 20 °C Fdil, Naima; Itto, My Youssef Ait; Ali, Mustapha Ait; Karim, Abdellah; Daran, Jean-Claude; Tetrahedron Letters; vol. 43; nb. 48; (2002); p. 8769 - 8772 View in Reaxys
2 g	With peracetic acid, sodium carbonate in chloroform, Time= 2.5h, T= 20 °C Tatarova, L. E.; Korchagina, D. V.; Volcho, K. P.; Salakhutdinov, N. F.; Barkhash, V. A.; Russian Journal of Organic Chemistry; vol. 39; nb. 8; (2003); p. 1076 - 1082; Zhurnal Organicheskoi Khimii; vol. 39; nb. 8; (2003); p. 1147 - 1153 View in Reaxys

	With peracetic acid, sodium acetate in dichloromethane, T= 0 - 20 °C Castro, Juan M.; Linares-Palomino, Pablo J.; Salido, Sofia; Altarejos, Joaquin; Nogueras, Manuel; Sanchez, Adolfo; Tetrahedron; vol. 61; nb. 47; (2005); p. 11192 - 11203 View in Reaxys
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Yield	Conditions & References	
100 %	With water in acetic acid, Time= 1h, T= 64.84 °C , pH= 5.2 Raja, Robert; Thomas, John Meurig; Xu, Mingcan; Harris, Kenneth D. M.; Greenhill-Hooper, Michael; Quill, Kieran; Chemical Communications (Cambridge, United Kingdom); nb. 4; (2006); p. 448 - 450 View in Reaxys	
88 %	With oxygen, isobutyraldehyde, polybenzimidazole bound Ni(acac)₂ in dichloromethane, Time= 4h, T= 25 °C , Epoxidation Wentzel, Bastienne B.; Leinonen, Salla-M.; Thomson, Stephen; Sherrington, David C.; Feiters, Martinus C.; Nolte, Roeland J. M.; Journal of the Chemical Society, Perkin Transactions 1: Organic and Bio-Organic Chemistry (1972-1999); nb. 20; (2000); p. 3428 - 3431 View in Reaxys	
87 %	With sodium hydroxide, sodium tungstate, phenyl-phosphonic acid, dihydrogen peroxide, [Me(n-C₈H₁₇)₃N]HSO₄ in water, Time= 12h, T= 25 °C Kon, Yoshihiro; Ono, Yutaka; Matsumoto, Tomohiro; Sato, Kazuhiko; Synlett; nb. 7; (2009); p. 1095 - 1098 View in Reaxys	
86 %	With oxygen, isobutyraldehyde, bis<3-(p-tert-butylbenzyl)pentane-2,4-dionato>nickel(II) in dichloromethane, Time= 4h, T= 25 °C , p= 760Torr Wentzel, Bastienne B.; Gosling, Patricia A.; Feiters, Martin C.; Nolte, Roeland J. M.; Journal of the Chemical Society, Dalton Transactions: Inorganic Chemistry (1972-1999); nb. 13; (1998); p. 2241 - 2246 View in Reaxys	
86 %	With oxygen, isobutyraldehyde, β-diketonate complex of nickel(II) in dichloromethane, Time= 4h, T= 25 °C , p= 760Torr , ΔH(excit.), ΔS(excit.), Mechanism, Kinetics, Thermodynamic data Wentzel, Bastienne B.; Gosling, Patricia A.; Feiters, Martin C.; Nolte, Roeland J. M.; Journal of the Chemical Society, Dalton Transactions: Inorganic Chemistry (1972-1999); nb. 13; (1998); p. 2241 - 2246 View in Reaxys	
86 %	With oxygen, isobutyraldehyde, β-diketonate complex of nickel(II) in dichloromethane, Time= 4h, T= 25 °C , p= 760Torr , effect of various catalysts, Product distribution Wentzel, Bastienne B.; Gosling, Patricia A.; Feiters, Martin C.; Nolte, Roeland J. M.; Journal of the Chemical Society, Dalton Transactions: Inorganic Chemistry (1972-1999); nb. 13; (1998); p. 2241 - 2246 View in Reaxys	
82 %	With Co(SALEN)₂, oxygen in acetonitrile, Time= 4h, T= 20 °C Kowalski, Grzegorz; Pielichowski, Jan; Synlett; nb. 12; (2002); p. 2107 - 2109 View in Reaxys	
82 %	With sodium hypochlorite, tetrabutyl-ammonium chloride, manganese porphyrin Mn₁ - 4-tert-butyl pyridine system in dichloromethane, Time= 3h Elemans, Johannes A. A. W.; Bijsterveld, Edward J. A.; Rowan, Alan E.; Nolte, Roeland J. M.; Chemical Communications (Cambridge, United Kingdom); nb. 24; (2000); p. 2443 - 2444 View in Reaxys	

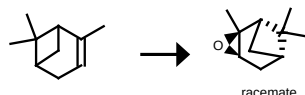
78 %	With 1H-imidazole, urea hydrogen peroxide addition compound, acetic anhydride in chloroform, Time= 3h, T= 22 °C Gonsalves, Antonio M. D'A. Rocha; Johnstone, Robert A. W.; Pereira, Mariette M.; Shaw, Jacqueline; Journal of Chemical Research, Miniprint; nb. 8; (1991); p. 2101 - 2118 View in Reaxys
70 %	With oxygen, isobutyraldehyde, <bis(pyridin-2-carboxaldehyde) ethylenediimine>cobalt dichloride in acetonitrile, T= 25 °C Reddy, M. Madhava; Punniyamurthy, T.; Iqbal, Javed; Tetrahedron Letters; vol. 36; nb. 1; (1995); p. 159 - 162 View in Reaxys
62 %	With sodium hydroxide, carbon dioxide, 1-n-butyl-2,3-dimethylimidazolium tetrafluoroborate, magnesium sulfate, Time= 5h, T= 20 °C , Electrochemical reaction Ho, Kam-Piu; Wong, Kwok-Yin; Chan, Tak Hang; Tetrahedron; vol. 62; nb. 28; (2006); p. 6650 - 6658 View in Reaxys
55 %	With disodium hydrogenphosphate, dihydrogen peroxide, perfluoroheptadecan-9-one in ethyl acetate, 1,2-dichloroethane, Time= 0.5h, Heating Vliet, Michiel C. A. van; Arends, Isabel W. C. E.; Sheldon, Roger A.; Chemical Communications (Cambridge, United Kingdom); nb. 3; (1999); p. 263 - 264 View in Reaxys
55 %	With disodium hydrogenphosphate, dihydrogen peroxide, perfluoroheptadecan-9-one in ethyl acetate, 1,2-dichloroethane, Time= 0.5h, Heating, Rate constant Vliet, Michiel C. A. van; Arends, Isabel W. C. E.; Sheldon, Roger A.; Chemical Communications (Cambridge, United Kingdom); nb. 3; (1999); p. 263 - 264 View in Reaxys
54 %	With manganese sulphate, dihydrogen peroxide, sodium hydrogencarbonate in N,N-dimethyl-formamide, Time= 16h, pH= 8.0 Lane, Benjamin S.; Vogt, Matthew; DeRose, Victoria J.; Burgess, Kevin; Journal of the American Chemical Society; vol. 124; nb. 40; (2002); p. 11946 - 11954 View in Reaxys
3 %	With disodium hydrogenphosphate, 2,2,2-trifluoroethanol, dihydrogen peroxide, Time= 0.5h, Heating Vliet, Michiel C. A. van; Arends, Isabel W. C. E.; Sheldon, Roger A.; Synlett; nb. 2; (2001); p. 248 - 250 View in Reaxys
57 % Chromat.	With dihydrogen peroxide, ammonium heptamolybdate, bis(tri-n-butyltin)oxide in chloroform, Time= 3h, T= 25 °C Kamiyama, Tsutomu; Inoue, Masami; Enomoto, Saburo; Chemistry Letters; (1989); p. 1129 - 1130 View in Reaxys
	With iodosylbenzene, binuclear Cu(II) in acetonitrile, Time= 1h, T= 25 °C , Yield given Tai, Alice Fan; Margerum, Lawrence D.; Valentine, Joan Selverstone; Journal of the American Chemical Society; vol. 108; nb. 16; (1986); p. 5006 - 5008 View in Reaxys
67 % Chromat.	With <N,N'-bis(salicylidene-γ-iminopropyl)methylaminato>cobalt (II), oxygen, 2-methyl-cyclohexanone, Time= 6h, T= 75 °C , p= 760Torr Takai, Toshihiro; Hata, Eiichiro; Yoroze, Kiyotaka; Mukaiyama, Teruaki; Chemistry Letters; nb. 10; (1992); p. 2077 - 2080 View in Reaxys
	With anhydrous sodium benzoate, dihydrogen peroxide, Mn(III)-porphyrin in dichloromethane, water, Time= 1.33333h, T= 0 °C

	Anelli, Pier Lucio; Banfi, Stefano; Legramandi, Francesco; Montanari, Fernando; Pozzi, Gianluca; Quici, Silvio; Journal of the Chemical Society, Perkin Transactions 1: Organic and Bio-Organic Chemistry (1972-1999); nb. 12; (1993); p. 1345 - 1358 View in Reaxys
20 % Chromat.	With 4-picoline, iodosylbenzene, Mn-complex in dichloromethane, Time= 3h, Ambient temperature Gosling, P. A.; Sijbesma, R. P.; Spek, A. L.; Nolte, R. J. M.; Recueil des Travaux Chimiques des Pays-Bas; vol. 112; (1993); p. 404 - 406 View in Reaxys
73 % Chromat.	With dihydrogen peroxide, benzoic acid in dichloromethane, water, Time= 0.166667h, T= 0 °C Anelli, Pier Lucio; Banfi, Stefano; Montanari, Fernando; Quici, Silvio; Journal of the Chemical Society, Chemical Communications; nb. 12; (1989); p. 779 - 780 View in Reaxys
	With oxygen, manganese(III)porphyrinate in water, acetone, Time= 8h, T= 40 °C , Irradiation, Yield given Hennig, Horst; Behling, Joerdis; Meusinger, Reinhard; Weber, Lutz; Chemische Berichte; vol. 128; nb. 3; (1995); p. 229 - 234 View in Reaxys
90 % Chromat.	With (CH₃)₃CHO, oxygen in various solvent(s), Time= 4h, T= 25 °C , p= 760Torr Pozzi, Gianluca; Montanari, Fernando; Rispens, Minze T.; Synthetic Communications; vol. 27; nb. 3; (1997); p. 447 - 452 View in Reaxys
	With 1,3-dioxo-1,3-dihydroisindole-5-peroxycarboxylic acid in dichloromethane, Time= 2h, T= 20 °C James, Alun P.; Johnstone, Robert A. W.; McCarron, Moya; Sankey, J. Phillip; Trenbith, Brian; Chemical Communications (Cambridge, United Kingdom); nb. 3; (1998); p. 429 - 430 View in Reaxys
	With n-ethyl morpholine, 1-methyl-1H-imidazole, oxygen, sodium formate, Rh-5, Mn-1 in water, Time= 1h Schenning, Albertus P. H. J.; Lutje Spelberg, Jeffrey H.; Hubert, Dominicus H. W.; Feiters, Martinus C.; Nolte, Roeland J. M.; Chemistry--A European Journal; vol. 4; nb. 5; (1998); p. 871 - 880 View in Reaxys
20 % Chromat.	With 4-picoline, iodosylbenzene, Mn-complex in dichloromethane, Time= 3h, Ambient temperature, other non-functionalized alkenes Gosling, P. A.; Sijbesma, R. P.; Spek, A. L.; Nolte, R. J. M.; Recueil des Travaux Chimiques des Pays-Bas; vol. 112; (1993); p. 404 - 406 View in Reaxys
	With Mn(TDCPP)OAc, dicetyl hydrogen phosphate, rhodium⁽³⁺⁾ cation in tetrahydrofuran, ethanol, Time= 1h, T= 75 °C , influence of the membran system, other epoxidations, Product distribution Schenning, Albertus P. H. J.; Hubert, Dominicus H. W.; Esch, Jan H. van; Feiters, Martinus C.; Nolte, Roeland J. M.; Angewandte Chemie; vol. 106; nb. 23/24; (1994); p. 2587 - 2588 View in Reaxys
	With dihydrogen peroxide, methyltrioxorhenium (VII) in water, acetonitrile, T= 25 °C , pH 1; epoxidation of alkyl-substituted olefins by H₂O₂ catalyzed by CH₃ReO₃ in MeCN-H₂O or in CH₃OD; NMR, spectrophotometric and thermometric methods; catalytic intermediates; kinetics and mechanism; effect of substituents, effect of solvent, Rate constant Al-Ajlouni, Ahmad M.; Espenson, James H.; Journal of Organic Chemistry; vol. 61; nb. 12; (1996); p. 3969 - 3976 View in Reaxys
	With chemically modified mesoporous silica gel, dihydrogen peroxide, tris(cetylpyridinium)12-tungstophosphate, Time= 2h, T= 70 °C Sakamoto, Takaaki; Pac, Chyongjin; Tetrahedron Letters; vol. 41; nb. 51; (2000); p. 10009 - 10012 View in Reaxys

	With manganese sulphate, dihydrogen peroxide, Tetramethylammonium hydrogen carbonate in various solvent(s), Time= 3h, T= 20 °C Tong, Kit-Ho; Wong, Kwok-Yin; Chan, Tak Hang; Organic Letters; vol. 5; nb. 19; (2003); p. 3423 - 3426 View in Reaxys
	With tert.-butylhydroperoxide, triethylamine, bis(tetrahydrofuran)dichloridodioxidomolybdenum(VI), silica MCM-41 in decane, Time= 24h, T= 55 °C Nunes, Carla D.; Valente, Anabela A.; Pillinger, Martyn; Rocha, Joao; Goncalves, Isabel S.; Chemistry--A European Journal; vol. 9; nb. 18; (2003); p. 4380 - 4390 View in Reaxys
	With pyridine, sodium hypochlorite, tetrabutyl-ammonium chloride, manganese porphyrin catalyst in dichloromethane, water, Time= 3h, Kinetics, Further Variations: Catalysts, Reagents Elemans, Johannes A. A. W.; Bijsterveld, Edward J. A.; Rowan, Alan E.; Nolte, Roeland J. M.; European Journal of Organic Chemistry; nb. 5; (2007); p. 751 - 757 View in Reaxys
85 % Chromat.	With Novozym 435, dihydrogen peroxide, carbonic acid dimethyl ester, Time= 16h, T= 20 °C Klaas, Mark Ruesch gen.; Warwel, Siegfried; Organic Letters; vol. 1; nb. 7; (1999); p. 1025 - 1026 View in Reaxys
	Example Name 9 EXAMPLE 9 To a mechanically stirred solution of α-pinene (0.01 mol), dodecane (0.001 mol), urea (0.208 mol), sodium bicarbonate (0.003 mol) and manganese sulphate (0.1 mmol) in 10.0 ml of water and 30 ml acetonitrile at 25.deg. C. is added 30percent aqueous hydrogen peroxide (0.4 mol) in three equal portions over a period of 3 hours. After 6 hours the reaction mixture was extracted with 4*5 ml diethyl ether. The combined organic layer was dried over anhydrous sodium sulphate. Removal of solvent yielded α-pinene oxide in 85percent yield with selectivity 93percent. With dihydrogen peroxide, urea, manganese sulphate, N-dodecane, sodium hydrogencarbonate in water, acetonitrile, Time= 9h, T= 25 °C , Product distribution / selectivity Patent; Khan, Noor-Ul Hasan; Razi Abdi, Sayed Hasan; Kureshy, Rukhsana Ilyas; Singh, Surendra; Ahmed, Irshad; Jasra, Raksh Vir; Ghosh, Pushpito Kumar; US2005/222440; (2005); (A1) English View in Reaxys
	Example Name 12 The procedure of Example 6 was repeated but using α-pinene (3.7g), instead of the styrene, and using MnAlPO-5 (0.25g) as catalyst. The reaction temperature employed was 65.deg.C and the reaction time was 1 hour.Conversion was 25.9percent and the selectivity for α-pinene-oxide was 100percent. With acetylperoxyborate, MnAlPO-5 in water, Time= 1h, T= 65 °C , Product distribution / selectivity Patent; U.S. BORAX, INC.; WO2006/43075; (2006); (A1) English View in Reaxys
	Example Name C.1 Example Title COMPARATIVE EXAMPLE 1 (ACCORDING TO DE-OS 28 35 940) COMPARATIVE EXAMPLE 1 (ACCORDING TO DE-OS 28 35 940) 75.7 g (0.5 mole) 90percent alpha-pinene, 187 g chloroform and 79.8 g (0.75 mole) anhydrous sodium carbonate are introduced into a 1 liter flask equipped with a stirrer, an internal thermometer, a reflux condenser and a dropping funnel.* Subsequently, 116.3 g (0.59 mole) PES-40 are added dropwise with cooling in the course of 1.5 hours in such a way that the reaction temperature is 40.deg. C. *and heated to 35.deg. C. Stirring is continued for 1 hour at 40.deg. C., and subsequently 200 g water are added to the reaction mixture, whereby the sodium acetate formed is dissolved. The organic phase is separated off and washed again with 100 ml water. After distilling off the chloroform under vacuum in the rotary evaporator, 89 g alpha-pinene oxide in a 61percent concentration are obtained; this corresponds to a yield of 71percent of the theoretical, based on alpha-pinene.

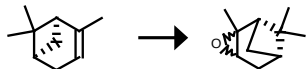
	With sodium carbonate in chloroform, water Patent; Peroxid-Chemie GmbH; US4882442; (1989); (A1) English View in Reaxys
	Example Name 8 Example Title EXAMPLE 8 EXAMPLE 8 Batch: 138 g (1.0 mole) 99percent alpha-pinene 303 g benzene 106 g (1.0 mole) anhydrous sodium carbonate 235 g (1.19 mole) PES-40 containing 4 g (0.05 mole) sodium acetate Method: execution and conditions corresponding to example 1, except for different reaction time, of 5 hours. Result: 121 g alpha-pinene oxide with a content of 97percent, corresponding to a yield of 77percent of the theoretical, based on alpha-pinene. With sodium acetate, sodium carbonate in benzene Patent; Peroxid-Chemie GmbH; US4882442; (1989); (A1) English View in Reaxys
	Example Name 1 Example Title EXAMPLE 1 EXAMPLE 1 75.7 g (0.5 mole) 90percent alpha-pinene, 187 g chloroform and 42.4 g (0.4 mole) anhydrous sodium carbonate are introduced into a 1 liter flask equipped with a stirrer, a reflux condenser, an internal thermometer and a dropping funnel and heated to 25.deg. C. Subsequently, 116 g (0.59 mole) PES-40 to which 2 g (0.025 mole) sodium acetate have been added with stirring are added dropwise with brine cooling in the course of 1 hour in such a way that the reaction temperature is 30.deg. C. Subsequently, agitation is continued for a further 2 hours at 30.deg. C. By adding 200 g water, the sodium acetate thus formed is dissolved, and after phase separation, washed with 100 g 7percent sodium hydrogen carbonate solution. After removing the chloroform in the rotary evaporator, 76 g alpha-pinene oxide with a 95percent content are obtained; this corresponds to a yield of 95percent of the theoretical, based on alpha-pinene. With sodium acetate, sodium carbonate in chloroform, water Patent; Peroxid-Chemie GmbH; US4882442; (1989); (A1) English View in Reaxys
	With 5-chloro-7-iodo-8-quinolinolatomanganese(III), ammonium acetate, dihydrogen peroxide, acetic acid in water, acetone, Time= 3h, T= 10 °C Zhong, Sheng; Fu, Zaihui; Tan, Yueming; Xie, Qingji; Xie, Fang; Zhou, Xiaoping; Ye, Zhengpei; Peng, Guosheng; Yin, Dulin; Advanced Synthesis and Catalysis; vol. 350; nb. 6; (2008); p. 802 - 806 View in Reaxys
95 %Chromat.	With 1-methyl-1H-imidazole, 3-methyl-1H-pyrazole, dihydrogen peroxide, methyltrioxorhenium (VII), Time= 5h, T= 10 °C , Neat (no solvent) Yamazaki, Shigekazu; Organic and Biomolecular Chemistry; vol. 8; nb. 10; (2010); p. 2377 - 2385 View in Reaxys
40.1 %Chromat.	With dihydrogen peroxide, sodium hydrogencarbonate in N,N-dimethyl-formamide, Time= 4h, T= -0.16 °C Qi, B.; Lu, X.-H.; Zhou, D.; Xia, Q.-H.; Tang, Z.-R.; Fang, S.-Y.; Pang, T.; Dong, Y.-L.; Journal of Molecular Catalysis A: Chemical; vol. 322; nb. 1-2; (2010); p. 73 - 79 View in Reaxys
	With pyridine-2,6-dicarboxylic acid, iron trichloride hexahydrate, N¹,N¹-Dimethyl-N²-cyclohexylformamidine, dihydrogen peroxide in 1,1-dimethylpropan-1-ol, water, Time= 1h, T= 20 °C , Air, chemoselective reaction

	Schroeder, Kristin; Join, Benoit; Junge, Kathrin; Beller, Matthias; Enthaler, Stephan; Advanced Synthesis and Catalysis; vol. 352; nb. 10; (2010); p. 1771 - 1778 View in Reaxys
76 %Chromat.	With dodeca-tungstophosphoric acid, dihydrogen peroxide in acetonitrile, Time= 3h, T= 50 °C Maksimchuk, Nataliya V.; Arzumanov, Sergey S.; Chesalov, Yurii A.; Melgunov, Maxim S.; Stepanov, Alexander G.; Kholdeeva, Oxana A.; Kovalenko, Konstantin A.; Fedin, Vladimir P.; Inorganic Chemistry; vol. 49; nb. 6; (2010); p. 2920 - 2930 View in Reaxys
	Example Name 13.3 After 2.85 mL of a - pinene (15 mmol) and 2.37 mL of octanoic acid (15 mmol) were dissolved in 8 mL of toluene, 150 mg of the catalyst obtained in (2) was added into the solution. The mixture was slowly stirred at room temperature to initiate reaction while gradually adding 2.6 mL of H₂O₂ (23 mmol) into the mixture. After 4 hours later, the reaction mixture was filtered to recover catalyst particles. The filtrate was vaporized under reduced pressure and subjected to column chromatography to separate a product. The separated a - pinene oxide compound was identified through ¹H NMR, ¹³C NMR, and mass analysis. A portion of the organic phase was sampled at a regular time interval to identify the product. EPO <DP n="32"/>a - pinene oxide: oil, boiling point: 102-104 °C/50 mm.¹H-NMR (CDCl₃, 300 MHz): δ= 0.91 (3H₁ s, CH₃), 1.30 (3H, s, CH₃), 1.32 (3H, s, CH₃), 1.59 (1 H, m, CH), 1.72 (1 H, m, CH), 1.90-2.05 (4H, m, CH₂), 3.08 (1 H, m, CH), ¹³C-NMR (CDCl₃, 300 MHz): δ= 60.23, 56.7, 44.9, 40.4, 39.6, 27.64, 26.72, 25.87, 22.41, 20.18. MS (EI) m/z 152 (M⁺). With octanoic acid, dihydrogen peroxide, FerlipaseCB⁽⁷⁾ polymer beads in toluene, Time= 4h, T= 20 °C, Conversion of starting material Patent; POSTECH ACADEMY-INDUSTRY FOUNDATION; WO2007/46575; (2007); (A1) English View in Reaxys
44 %Chromat.	With 1H-imidazole, iron trichloride hexahydrate, ethyl 2-oxo-cyclopentanecarboxylate in acetonitrile, Time= 20h, T= 20 °C Schroeder, Kristin; Join, Benoit; Amali, Arlin Jose; Junge, Kathrin; Beller, Matthias; Ribas, Xavi; Costas, Miguel; Angewandte Chemie, International Edition; vol. 50; nb. 6; (2011); p. 1425 - 1429; Angewandte Chemie; vol. 123; nb. 6; (2011); p. 1461 - 1465 View in Reaxys
	With dihydrogen peroxide in water, Time= 5h, T= 25 °C Chattopadhyay, Tanmay; Kogiso, Masaki; Aoyagi, Masaru; Asakawa, Masumi; Shimizu, Toshimi; Yui, Hiroharu; Green Chemistry; vol. 13; nb. 5; (2011); p. 1138 - 1140 View in Reaxys
	General procedure: Reaction conditions: A 50 mL round bottomed flask is charged with alkene (20 mmol), isobutyraldehyde (100 mmol), metal salt, (0.18 mmol), CH₂Cl₂ (15 mL) attached to a O₂ filled balloon and stirred at room temperature. At the end of the reaction the mixture is filtered, diluted with CH₂Cl₂, washed with NaHCO₃ solution (10percent) to remove the acid and dried (Na₂SO₄). The residue is purified by column chromatography (hexane-ethyl acetate) to afford the corresponding epoxides. With oxygen, Mn(OAc)₂·4H₂O, isobutyraldehyde in dichloromethane, Time= 9h, T= 20 °C Serra, Armenio C.; Rocha Gonsalves, Antonio M. D'A.; Tetrahedron Letters; vol. 52; nb. 27; (2011); p. 3489 - 3491 View in Reaxys

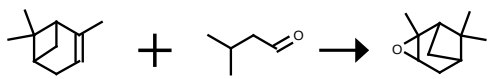

Rx-ID: 4465774 [View in Reaxys](#) 4/63

Yield	Conditions & References
75 %	With sodium hydroxide, dihydrogen peroxide, 1-(toluene-p-sulphonyl)imidazole in methanol, Time= 3h Kluge, R.; Schulz, M.; Liebsch, S.; Tetrahedron; vol. 52; nb. 8; (1996); p. 2957 - 2976

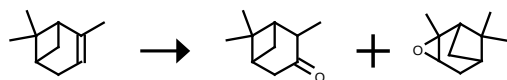
	View in Reaxys
54 %	With manganese sulphate, sodium hydrogencarbonate, sodium carbonate in N,N-dimethyl-formamide, pH= 8 Lane, Benjamin S.; Burgess, Kevin; Journal of the American Chemical Society; vol. 123; nb. 12; (2001); p. 2933 - 2934 View in Reaxys

	
Rx-ID: 4992131 View in Reaxys 5/63	
Yield	Conditions & References
100 %	With 4-(tert-butyl)pyridine, urea hydrogen peroxide addition compound, methyltrioxorhenium (VII) in nitromethane, water, Time= 5h, T= 0 °C Michel, Typhne; Kuehn, Fritz E.; Betz, Daniel; Cokoja, Mirza; Sieber, Volker; Journal of Molecular Catalysis A: Chemical; vol. 340; nb. 1-2; (2011); p. 9 - 14 View in Reaxys
83 %	With dihydrogen peroxide, potassium hydrogencarbonate, dicyclohexyl-carbodiimide in ethanol, water, Time= 24h, Ambient temperature, other reagents: H₂O₂/Na₃PO₄*12H₂O/dicyclohexylcarbodiimide, H₂O₂/Amberlite IRC-50/dicyclohexylcarbodiimide, m-chloroperbenzoic acid, H₂O₂/KHCO₃/benzonitrile Majetich, George; Hicks, Rodgers; Sun, Guang-ri; McGill, Patrick; Journal of Organic Chemistry; vol. 63; nb. 8; (1998); p. 2564 - 2573 View in Reaxys
83 %Chromat.	With sodium periodate in water, acetonitrile, Time= 3h, T= 20 °C Tangestaninejad, Shahram; Moghadam, Majid; Mirkhani, Valiollah; Mohammadpoor-Baltork, Iraj; Saeedi, Mohammad Saleh; Applied Catalysis A: General; vol. 381; nb. 1-2; (2010); p. 233 - 241 View in Reaxys

	
Rx-ID: 9780746 View in Reaxys 6/63	
Yield	Conditions & References
75 %, 9 %	With dihydrogen peroxide, methyltrioxorhenium (VII) in dichloromethane, water, acetonitrile, Time= 1h, T= 25 °C Saladino, Raffaele; Andreoni, Alessia; Neri, Veronica; Crestini, Claudia; Tetrahedron; vol. 61; nb. 5; (2005); p. 1069 - 1076 View in Reaxys

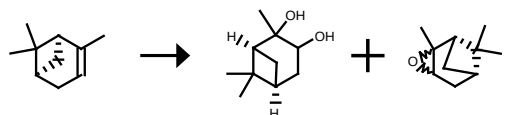
	
Rx-ID: 24503142 View in Reaxys 7/63	
Yield	Conditions & References
86%	Example Name 2 Example Title EXAMPLE 2 EXAMPLE 2 A mixture of 272 mg of α-pinene, 517 mg of isovaleraldehyde and 10 ml of dichloromethane was stirred overnight under an oxygen atmosphere at 25.deg. C. Analysis of the reaction mixture by GC showed that α-pinene oxide had been formed in 86percent yield. in dichloromethane

Patent; Sumitomo Chemical Company, Limited; US5367087; (1994); (A1) English
[View in Reaxys](#)



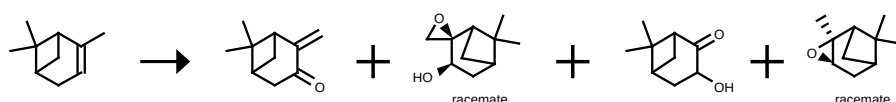
Rx-ID: 10112053 [View in Reaxys](#) 8/63

Yield	Conditions & References
59 %, 32 %	With poly-o-anisidine, oxygen, isobutyraldehyde, bis(8-hydroxyquinolino)cobalt(II) in acetonitrile, Time= 1h, T= 65 °C Blaz, Edyta; Pielichowski, Jan; Molecules; vol. 11; nb. 1; (2006); p. 115 - 120 View in Reaxys
41 %, 55 %	With poly-o-toluidine, oxygen, isobutyraldehyde, bis(8-hydroxyquinolino)cobalt(II) in acetonitrile, Time= 1h, T= 65 °C Blaz, Edyta; Pielichowski, Jan; Molecules; vol. 11; nb. 1; (2006); p. 115 - 120 View in Reaxys



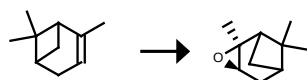
Rx-ID: 30947371 [View in Reaxys](#) 9/63

Yield	Conditions & References
85 %	With 4-(tert-butyl)pyridine, dihydrogen peroxide, methyltrioxorhenium (VII) in dichloromethane, water, Time= 5h, T= 0 °C Michel, Typhne; Kuehn, Fritz E.; Betz, Daniel; Cokoja, Mirza; Sieber, Volker; Journal of Molecular Catalysis A: Chemical; vol. 340; nb. 1-2; (2011); p. 9 - 14 View in Reaxys
11 %	With 2,4-dichloro-6-[[[(2-chlorophenyl)imino]methyl]phenol, dihydrogen peroxide, methyltrioxorhenium (VII) in dichloromethane, water, Time= 5h, T= 0 °C Michel, Typhne; Kuehn, Fritz E.; Betz, Daniel; Cokoja, Mirza; Sieber, Volker; Journal of Molecular Catalysis A: Chemical; vol. 340; nb. 1-2; (2011); p. 9 - 14 View in Reaxys



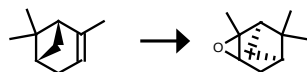
Rx-ID: 1815251 [View in Reaxys](#) 10/63

Yield	Conditions & References
46 % Spectr., 8 % Spectr., 10 % Spectr., 28 % Spectr.	With oxygen, 5,15,10,20-tetraphenylporphyrin, bis(acetylacetonate)oxovanadium in dichloromethane, T= 0 °C , Irradiation, Further byproducts given Adam, Waldemar; Braun, Martin; Griesbeck, Axel; Lucchini, Vittorio; Staab, Eugen; Will, Bernd; Journal of the American Chemical Society; vol. 111; nb. 1; (1989); p. 203 - 212 View in Reaxys

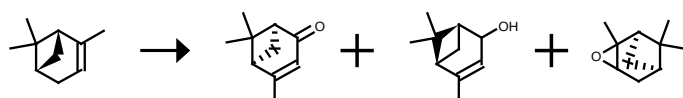


Rx-ID: 1815238 [View in Reaxys](#) 11/63

Yield	Conditions & References
98 %	With 3-chloro-benzenecarboxylic acid in dichloromethane, T= 22 °C Selva, Antonio; Ferrario, Francesco; Ventura, Paolo; Pellegata, Renato; Organic Mass Spectrometry; vol. 22; (1987); p. 523 - 529 View in Reaxys

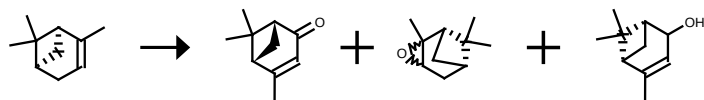

Rx-ID: 9587128 [View in Reaxys](#) 12/63

Yield	Conditions & References
78 %	With C₃₆H₄₄IrN₅, 2-benzenesulfonyl-3-phenyl-oxaziridine in dichloromethane, Time= 48h, optical yield given as percent de Camerano, Jose A.; Saemann, Christoph; Wade, Hubert; Gade, Lutz H.; Organometallics; vol. 30; nb. 3; (2011); p. 379 - 382 View in Reaxys
45 %	With phosphoric acid, sulfuric acid, dihydrogen peroxide, sodium tungstate, Aliquat (R). 336 in water, 1,2-dichloro-ethane, Time= 1h, T= 70 °C , pH= 1.6, microwave irradiation Bogdal, D.; Lukasiewicz, M.; Pielichowski, J.; Bednarski, S.; Synthetic Communications; vol. 35; nb. 23; (2005); p. 2973 - 2983 View in Reaxys
31 %	With dihydrogen peroxide, tetra-n-butyl-ammonium in acetonitrile, T= 31.85 °C Kamata, Keigo; Kotani, Miyuki; Yamaguchi, Kazuya; Hikichi, Shiro; Mizuno, Noritaka; Chemistry--A European Journal; vol. 13; nb. 2; (2007); p. 639 - 648 View in Reaxys
	With LDH-[Mn-salen], oxygen in toluene, Time= 6h, T= 24.85 °C , Product distribution, Further Variations: Reagents, Solvents Bhattacharjee, Samiran; Dines, Trevor J.; Anderson, James A.; Journal of Catalysis; vol. 225; nb. 2; (2004); p. 398 - 407 View in Reaxys

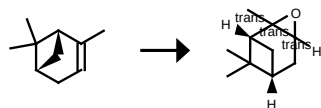

Rx-ID: 25929580 [View in Reaxys](#) 13/63

Yield	Conditions & References
85 % Chromat., 11 % Chromat., 4 % Chromat.	With 1H-imidazole, sodium periodate, Mn(III)-salen supported on Amberlite IRA-200 in water, acetonitrile, Time= 0.583333h, T= 20 °C Mirkhani, Valiollah; Moghadam, Majid; Tangestaninejad, Shahram; Bahramian, Bahram; Monatshefte fuer Chemie; vol. 138; nb. 12; (2007); p. 1303 - 1308 View in Reaxys
	With dihydrogen peroxide in acetonitrile, Time= 0.5h, Ultrasonic irradiation, Reflux Salavati, Hossein; Tangestaninejad, Shahram; Moghadam, Majid; Mirkhani, Valiollah; Mohammadpoor-Baltork, Iraj; Ultrasonics Sonochemistry; vol. 17; nb. 1; (2010); p. 145 - 152 View in Reaxys
	With dihydrogen peroxide in acetonitrile, Time= 0.666667h, T= 60 °C , Ultrasonic irradiation

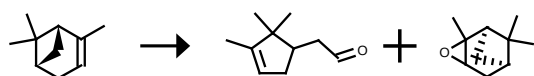
	Salavati, Hossein; Tangestaninejad, Shahram; Moghadam, Majid; Mirkhani, Valiollah; Mohammadpoor-Baltork, Iraj ; Ultrasonics Sonochemistry; vol. 17; nb. 2; (2010); p. 453 - 459 View in Reaxys
16 %Chromat., 8 %Chromat.	With dihydrogen peroxide in acetonitrile, Time= 0.666667h, Sonication Salavati, Hossein; Rasouli, Nahid ; Materials Research Bulletin; vol. 46; nb. 11; (2011); p. 1853 - 1859 View in Reaxys


Rx-ID: 5144579 [View in Reaxys](#) 14/63

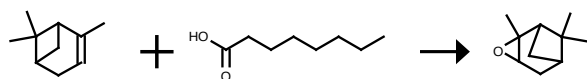
Yield	Conditions & References
	With air, benzaldehyde, molecular sieve, Time= 8h, T= 49.85 °C , p= 22501.8Torr , Yields of byproduct given. Title compound not separated from byproducts Raja, Robert; Sankar, Gopinathan; Thomas, John Meurig ; Chemical Communications (Cambridge, United Kingdom); nb. 9; (1999); p. 829 - 830 View in Reaxys
	With air, benzaldehyde, molecular sieve, Time= 8h, T= 49.85 °C , p= 22501.8Torr , Yield given, Title compound not separated from byproducts Raja, Robert; Sankar, Gopinathan; Thomas, John Meurig ; Chemical Communications (Cambridge, United Kingdom); nb. 9; (1999); p. 829 - 830 View in Reaxys


Rx-ID: 5265653 [View in Reaxys](#) 15/63

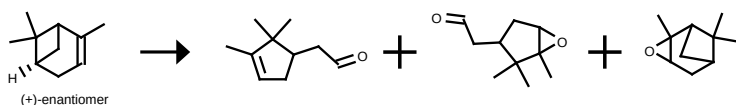
Yield	Conditions & References
	With CH ₃ NO ₃ P, dihydrogen peroxide, sodium tungstate, PW ₄ O ₂₄ [(C ₈ H ₁₇) ₃ NCH ₃] ₃ in benzene, Time= 1h, T= 60 °C , pH= 4.2, Epoxidation Villa de P., Aida L.; Sels, Bert F.; Vos, Dirk E. De; Jacobs, Pierre A. ; Journal of Organic Chemistry; vol. 64; nb. 19; (1999); p. 7267 - 7270 View in Reaxys


Rx-ID: 8678619 [View in Reaxys](#) 16/63

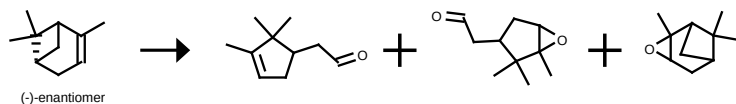
Yield	Conditions & References
	With Oxone (R), ethylenediaminetetraacetic acid, potassium carbonate, silica gel, 1,1,1-trifluoro-11-dodecen-2-one in acetonitrile, Time= 0.0833333h, T= 20 °C Song, Choong Eui; Lim, Jin Seok; Kim, Su Chang; Lee, Kee-Jung; Chi, Dae Yoon ; Chemical Communications (Cambridge, United Kingdom); nb. 24; (2000); p. 2415 - 2416 View in Reaxys


Rx-ID: 25667000 [View in Reaxys](#) 17/63

Yield	Conditions & References
	Example Name 13.3 Example Title (1) (3) Epoxidation of α-Pinene After 2.85 mL of α-pinene (15 mmol) and 2.37 mL of octanoic acid (15 mmol) were dissolved in 8 mL of toluene, 150 mg of the catalyst obtained in (2) was added into the solution. The mixture was slowly stirred at room temperature to initiate reaction while gradually adding 2.6 mL of H₂O₂ (23 mmol) into the mixture. After 4 hours later, the reaction mixture was filtered to recover catalyst particles. The filtrate was vaporized under reduced pressure and subjected to column chromatography to separate a product. The separated α-pinene oxide compound was identified through ¹H NMR, ¹³C NMR, and mass analysis. A portion of the organic phase was sampled at a regular time interval to identify the product. α-pinene oxide: oil, boiling point: 102-104.deg. C./50 mm: ¹H-NMR (CDCl₃, 300 MHz): δ=0.91 (3H, s, CH₃), 1.30 (3H, s, CH₃), 1.32 (3H, s, CH₃), 1.59 (1H, m, CH), 1.72 (1H, m, CH), 1.90-2.05 (4H, m, CH₂), 3.08 (1H, m, CH); ¹³C-NMR (CDCl₃, 300 MHz): δ=60.23, 56.7, 44.9, 40.4, 39.6, 27.64, 26.72, 25.87, 22.41, 20.18. MS (EI) m/z 152 (M⁺). With dihydrogen peroxide in toluene Patent: POSTECH FOUNDATION; POSTECH ACADEMY-INDUSTRY FOUNDATION; US2007/92867; (2007); (A1) English View in Reaxys

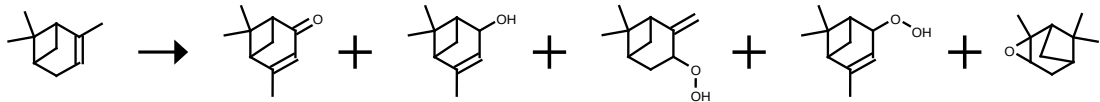

Rx-ID: 10079720 [View in Reaxys](#) 18/63

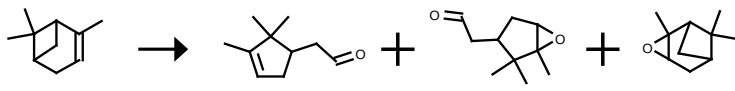
Yield	Conditions & References
98.8 %, 1.2 %	With tert.-butylhydroperoxide, air, C₂₂H₃₈ClMoNO₅Si, T= 55 °C , p= 760Torr , Product distribution, Further Variations: Catalysts, Solvents Valente, Anabela A.; Goncalves, Isabel S.; Lopes, Andre D.; Rodriguez-Borges, Jose E.; Pillinger, Martyn; Romao, Carlos C.; Rocha, Joao; Garcia-Mera, Xerardo; New Journal of Chemistry; vol. 25; nb. 7; (2001); p. 959 - 963 View in Reaxys
58.1 %, 15.3 %, 8.6 %	With tert.-butylhydroperoxide, C₂₂H₃₈ClMoNO₅Si, Time= 24h, T= 55 °C , p= 760Torr Valente, Anabela A.; Goncalves, Isabel S.; Lopes, Andre D.; Rodriguez-Borges, Jose E.; Pillinger, Martyn; Romao, Carlos C.; Rocha, Joao; Garcia-Mera, Xerardo; New Journal of Chemistry; vol. 25; nb. 7; (2001); p. 959 - 963 View in Reaxys

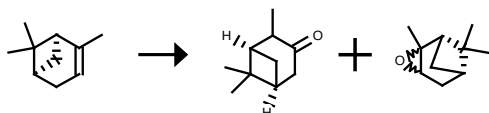

Rx-ID: 10151097 [View in Reaxys](#) 19/63

Yield	Conditions & References
98.8 %, 1.2 %	With tert.-butylhydroperoxide, air, C₂₂H₃₈ClMoNO₅Si, T= 55 °C , p= 760Torr , Product distribution, Further Variations: Catalysts, Solvents

	Valente, Anabela A.; Goncalves, Isabel S.; Lopes, Andre D.; Rodriguez-Borges, Jose E.; Pillinger, Martyn; Romao, Carlos C.; Rocha, Joao; Garcia-Mera, Xerardo ; New Journal of Chemistry; vol. 25; nb. 7; (2001); p. 959 - 963 View in Reaxys
58.1 %, 11.5 %, 9.8 %	With tert.-butylhydroperoxide, C ₂₂ H ₃₈ ClMoNO ₅ Si, Time= 24h, T= 55 °C , p= 760Torr Valente, Anabela A.; Goncalves, Isabel S.; Lopes, Andre D.; Rodriguez-Borges, Jose E.; Pillinger, Martyn; Romao, Carlos C.; Rocha, Joao; Garcia-Mera, Xerardo ; New Journal of Chemistry; vol. 25; nb. 7; (2001); p. 959 - 963 View in Reaxys

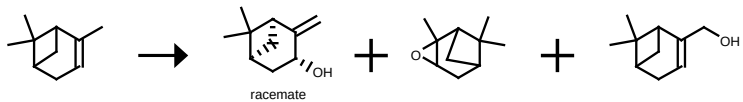
	
Rx-ID: 30029735 View in Reaxys 20/63	
Yield	Conditions & References
29 %, 29 %, 13.5 %, 7 %, 6 %	With oxygen, T= 89.84 °C , p= 750.075Torr Neuenschwander, Ulrich; Guignard, Florian; Hermans, Ive ; ChemSusChem; vol. 3; nb. 1; (2010); p. 75 - 84 View in Reaxys

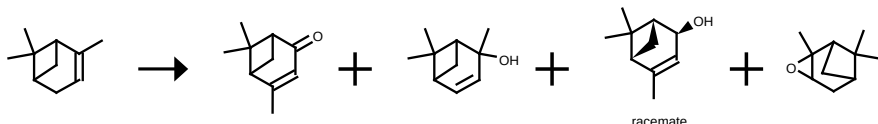
	
Rx-ID: 10112052 View in Reaxys 21/63	
Yield	Conditions & References
98.8 %, 1.2 %	With tert.-butylhydroperoxide, air, C ₂₂ H ₃₈ ClMoNO ₅ Si, T= 55 °C , p= 760Torr , Product distribution, Further Variations: Catalysts, Solvents Valente, Anabela A.; Goncalves, Isabel S.; Lopes, Andre D.; Rodriguez-Borges, Jose E.; Pillinger, Martyn; Romao, Carlos C.; Rocha, Joao; Garcia-Mera, Xerardo ; New Journal of Chemistry; vol. 25; nb. 7; (2001); p. 959 - 963 View in Reaxys

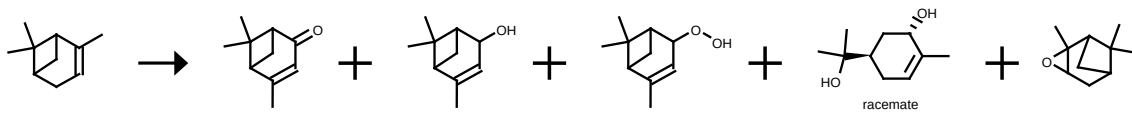
	
Rx-ID: 31120887 View in Reaxys 22/63	
Yield	Conditions & References
47 %, 15 %	With oxygen, isobutyraldehyde in acetonitrile, Time= 3h, T= 60 °C Pielichowski, Jan; Kowalski, Grzegorz ; Molecular Crystals and Liquid Crystals; vol. 522; (2010); p. 105 - 111 View in Reaxys

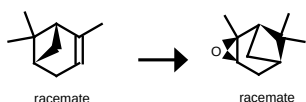
	
Rx-ID: 2197817 View in Reaxys 23/63	
Yield	Conditions & References
99 %	With sodium hypochlorite, (5,10,15,20-tetraphenyl-21H,23H-porphinato ⁽²⁻⁾)-κN ⁽²¹⁾ ,κN ⁽²²⁾ ,κN ⁽²³⁾ ,κN ⁽²⁴⁾)manganese, 1-n-Hexylimidazole in dichloromethane, water, Time= 0.333333h, T= 0 °C , pH=9.5; further olefines, also in presence of methyl trioctyl ammonium chloride; selectivity, Product distribution Banfi, Stefano; Montanari, Fernando; Penso, Michele; Sosnovskikh, Viecheslav; Vigano, Patrizia ; Gazzetta Chimica Italiana; vol. 117; nb. 11; (1987); p. 689 - 694 View in Reaxys

99 %	With sodium hypochlorite, Mn-TDCIPP, Aliquat (R). 336, 1-n-Hexylimidazole in ethanol, water, Time= 0.333333h, T= 0 °C , pH=9.5 Banfi, Stefano; Montanari, Fernando; Penso, Michele; Sosnovskikh, Viecheslav; Vigano, Patrizia; Gazzetta Chimica Italiana; vol. 117; nb. 11; (1987); p. 689 - 694 View in Reaxys
85 %	With sodium hydrogencarbonate in dichloromethane, Time= 1h, T= 5 °C Constantino, Mauricio Gomes; Lacerda, Valdemar; Invernize, Paulo Roberto; Filho, Luiz Carlos da Silva; Silva, Gil Valdo Jose da; Synthetic Communications; vol. 37; nb. 20; (2007); p. 3529 - 3539 View in Reaxys

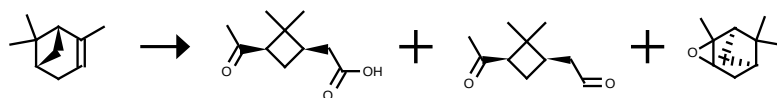
 racemate Rx-ID: 5261519 View in Reaxys 24/63	
Yield	Conditions & References
64 % Chromat., 6 % Chromat., 30 % Chromat.	With oxygen, 2,3,7,8,12,13,17,18-Br₈-5,10,15,20-(C₆F₅)₄-porphyrin in benzene, Time= 8h, T= 20 °C , Irradiation, Oxidation Hennig, Horst; Lupp, Doritt; Journal fuer Praktische Chemie (Weinheim, Germany); vol. 341; nb. 8; (1999); p. 757 - 767 View in Reaxys

 racemate Rx-ID: 5261518 View in Reaxys 25/63	
Yield	Conditions & References
13 % Chromat., 36 % Chromat., 40 % Chromat., 5 % Chromat.	With oxygen, {[5,10,15,20-(pentafluorophenyl)4]porphyrinato}iron(III)Cl in benzene, Time= 8h, T= 20 °C , Irradiation, Oxidation, Further byproducts given Hennig, Horst; Lupp, Doritt; Journal fuer Praktische Chemie (Weinheim, Germany); vol. 341; nb. 8; (1999); p. 757 - 767 View in Reaxys

 racemate Rx-ID: 30029736 View in Reaxys 26/63	
Yield	Conditions & References
	With oxygen, T= 89.84 °C , p= 750.075Torr Neuenschwander, Ulrich; Guignard, Florian; Hermans, Ivo; ChemSusChem; vol. 3; nb. 1; (2010); p. 75 - 84 View in Reaxys

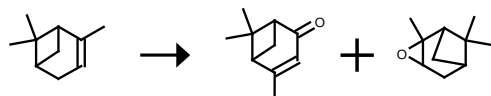
 racemate Rx-ID: 30060311 View in Reaxys 27/63	
Yield	Conditions & References
	With tert.-butylhydroperoxide in water, acetonitrile, Time= 2h, T= 60 °C

Chattopadhyay, Tanmay; Kogiso, Masaki; Asakawa, Masumi; Shimizu, Toshimi; Aoyagi, Masaru; Catalysis Communications; **vol.** 12; nb. 1; (2010); p. 9 - 13
[View in Reaxys](#)



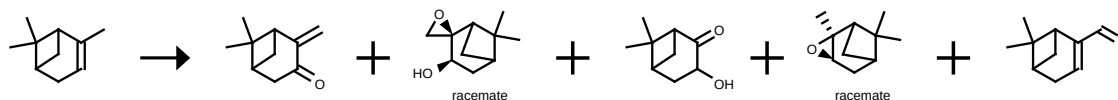
Rx-ID: 4673736 [View in Reaxys](#) 28/63

Yield	Conditions & References
	With ozone in pentane, T= -35 °C Griesbaum, Karl; Hilss, Michael; Bosch, Joachim; Tetrahedron; vol. 52; nb. 47; (1996); p. 14813 - 14826 View in Reaxys



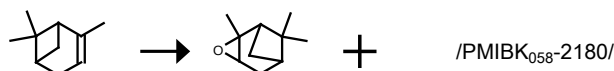
Rx-ID: 30252372 [View in Reaxys](#) 29/63

Yield	Conditions & References
88.4 % %Chromat., 6.7 %Chromat.	With tert.-butylhydroperoxide in water, N,N-dimethyl-formamide, Time= 5h, T= 90 °C Qi, B.; Lu, X.-H.; Fang, S.-Y.; Lei, J.; Dong, Y.-L.; Zhou, D.; Xia, Q.-H.; Journal of Molecular Catalysis A: Chemical; vol. 334; nb. 1-2; (2011); p. 44 - 51 View in Reaxys



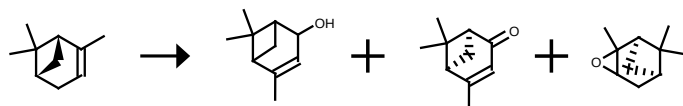
Rx-ID: 1815240 [View in Reaxys](#) 30/63

Yield	Conditions & References
46 % Spectr., 28 % Spectr., 8 % Spectr., 10 % Spectr., 8 % Spectr.	With oxygen, thiamine diphosphate, bis(acetylacetonate)oxovanadium in dichloromethane, T= 0 °C , Irradiation, other catalysts, Product distribution Adam, Waldemar; Braun, Martin; Griesbeck, Axel; Lucchini, Vittorio; Staab, Eugen; Will, Bernd; Journal of the American Chemical Society; vol. 111; nb. 1; (1989); p. 203 - 212 View in Reaxys

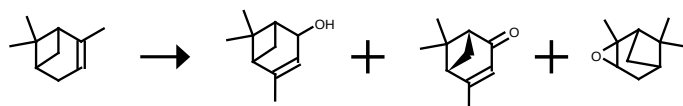


Rx-ID: 5743107 [View in Reaxys](#) 31/63

Yield	Conditions & References
	With tert.-butylhydroperoxide, tetrabutylammomium bromide, copper dichloride in dichloromethane, water, Time= 14h, T= 25 °C , Yield given. Yields of byproduct given Rothenberg, Gadi; Feldberg, Liron; Wiener, Harold; Sasson, Yoel; Journal of the Chemical Society, Perkin Transactions 2: Physical Organic Chemistry (1972-1999); nb. 11; (1998); p. 2429 - 2434 View in Reaxys


Rx-ID: 30061223 [View in Reaxys](#) 32/63

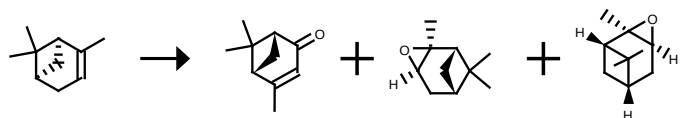
Yield	Conditions & References
7 % Chromat., 6 % Chromat.	With sodium periodate in water, acetonitrile, Time= 3h, T= 20 °C , under air Hatefi, Mehdi; Sheikhshoei, Iran; Moghadam, Majid; Mirkhani, Valiollah; Polyhedron; vol. 29; nb. 15; (2010); p. 2953 - 2958 View in Reaxys


Rx-ID: 30669346 [View in Reaxys](#) 33/63

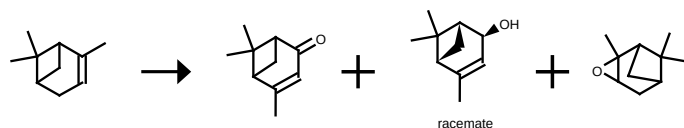
Yield	Conditions & References
	With dihydrogen peroxide in acetonitrile, Time= 6h, T= 20 °C , chemoselective reaction Islam, S. M.; Roy, Anupam Singha; Mondal, Paramita; Mubarak, Manir; Mondal, Sanchita; Hossain, Dildar; Banerjee, Satabdi; Santra, S. C.; Journal of Molecular Catalysis A: Chemical; vol. 336; nb. 1-2; (2011); p. 106 - 114 View in Reaxys


Rx-ID: 8751592 [View in Reaxys](#) 34/63

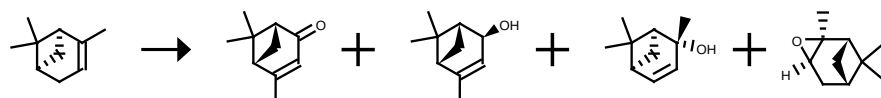
Yield	Conditions & References
	With haem monooxygenase cytochrome P_{450 cam} Bell, Stephen G.; Sowden, Rebecca J.; Wong, Luet-Lok; Chemical Communications (Cambridge, United Kingdom); nb. 7; (2001); p. 635 - 636 View in Reaxys
4 % Chromat., 31 % Chromat., 10 % Chromat., 4 % Chromat.	With P_{450 cam} wild type in various solvent(s), T= 30 °C , Product distribution, Further Variations: Reagents Bell, Stephen G.; Chen, Xuehui; Sowden, Rebecca J.; Xu, Feng; Williams, Jennifer N.; Wong, Luet-Lok; Rao, Zih; Journal of the American Chemical Society; vol. 125; nb. 3; (2003); p. 705 - 714 View in Reaxys


Rx-ID: 9312043 [View in Reaxys](#) 35/63

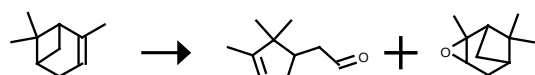
Yield	Conditions & References
16 %	With oxygen, isobutyraldehyde, [Ru(TAZS)(p-cymene)]₂ in dichloromethane, Time= 4h, T= 20 °C , Product distribution, Further Variations: Catalysts Fdil, Naima; Itto, My Youssef Ait; Ali, Mustapha Ait; Karim, Abdellah; Daran, Jean-Claude; Tetrahedron Letters; vol. 43; nb. 48; (2002); p. 8769 - 8772 View in Reaxys


 Rx-ID: 25979609 [View in Reaxys](#) 36/63

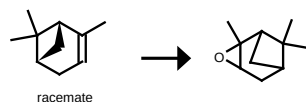
Yield	Conditions & References
	With oxygen, Co-Fe₃O₄, Time= 7h, T= 60 °C , p= 760.051Torr , Product distribution, Further Variations: Catalysts Menini, Luciano; Pereira, Marcio C.; Parreira, Luciana A.; Fabris, Jose D.; Gusevskaya, Elena V.; Journal of Catalysis; vol. 254; nb. 2; (2008); p. 355 - 364 View in Reaxys


 Rx-ID: 2057125 [View in Reaxys](#) 37/63

Yield	Conditions & References
38 % Spectr., 16 % Spectr., 31 % Spectr., 15 % Spectr.	With air, tetraphenylporphyrin iron(III) chloride in benzene, T= 20 °C , Irradiation, var. α-pinene/iron complex ratios and α-pinene conc., var. (tetraarylporphyrinato)iron(III) complexes; also with different oxidizing species; other cycloalkenes, Product distribution Weber, L.; Hommel, R.; Behling, J.; Haufe, G.; Hennig, H.; Journal of the American Chemical Society; vol. 116; nb. 6; (1994); p. 2400 - 2408 View in Reaxys

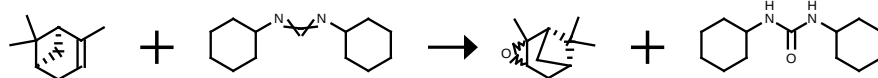

 Rx-ID: 4929002 [View in Reaxys](#) 38/63

Yield	Conditions & References
	With nitrogen trioxide, T= 24.9 °C , p= 15.001 - 150.01Torr , reaction in gas-phase, Product distribution, Mechanism Berndt, Torsten; Boege, Olaf; Journal of the Chemical Society, Faraday Transactions; vol. 93; nb. 17; (1997); p. 3021 - 3028 View in Reaxys
	With dihydrogen peroxide, acetic acid, [(1,4,7-trimethyl-1,4,7-triazacyclononaneMn(IV))2(O)3](PF₆)₂ in acetonitrile, Time= 0.25h, T= 25 °C , Product distribution, Further Variations: reaction time Mandelli, D.; Voitiski, K. B.; Schuchardt, U.; Shul'pin, G. B.; Chemistry of Natural Compounds; vol. 38; nb. 3; (2002); p. 243 - 245; Khimiya Prirodnikh Soedinenii; nb. 3; (2002); p. 203 - 205 View in Reaxys

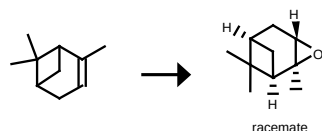

 Rx-ID: 435720 [View in Reaxys](#) 39/63

Yield	Conditions & References
	With peracetic acid, chloroform, acetic acid, inactive α-pinene oxide Arbusow, Michailow; Journal fuer Praktische Chemie (Leipzig); vol. <2> 127; (1930); p. 1,8; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 62; (1930); p. 607,611, 613 View in Reaxys
	With meta-chloroperoxybenzoic acid, levorotatory α-pinene oxide

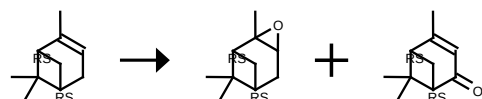
	Prileshajew; Werschuk; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 61; (1929); p. 463; Chem. Zentralbl.; vol. 100; nb. II; (1929); p. 2556 View in Reaxys
	With peracetic acid, diethyl ether, acetic acid, levorotatory α-pinene oxide Arbusow; Michailow; Journal fuer Praktische Chemie (Leipzig); vol. <2> 127; (1930); p. 1,8; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 62; (1930); p. 607,611, 613 View in Reaxys
	With peracetic acid, chloroform, acetic acid, levorotatory α-pinene oxide Arbusow; Michailow; Journal fuer Praktische Chemie (Leipzig); vol. <2> 127; (1930); p. 1,8; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 62; (1930); p. 607,611, 613 View in Reaxys
	With meta-chloroperoxybenzoic acid, dextrorotatory α-pinene oxide Prileshajew; Werschuk; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 61; (1929); p. 463; Chem. Zentralbl.; vol. 100; nb. II; (1929); p. 2556 View in Reaxys
	With peracetic acid, diethyl ether, acetic acid, dextrorotatory α-pinene oxide Arbusow; Michailow; Journal fuer Praktische Chemie (Leipzig); vol. <2> 127; (1930); p. 1,8; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 62; (1930); p. 607,611, 613 View in Reaxys
	With peracetic acid, chloroform, acetic acid, dextrorotatory α-pinene oxide Arbusow; Michailow; Journal fuer Praktische Chemie (Leipzig); vol. <2> 127; (1930); p. 1,8; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 62; (1930); p. 607,611, 613 View in Reaxys
	With peracetic acid, diethyl ether, acetic acid, inactive α-pinene oxide Arbusow; Michailow; Journal fuer Praktische Chemie (Leipzig); vol. <2> 127; (1930); p. 1,8; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 62; (1930); p. 607,611, 613 View in Reaxys
	With meta-chloroperoxybenzoic acid, inactive α-pinene oxide Prileshajew; Werschuk; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 61; (1929); p. 463; Chem. Zentralbl.; vol. 100; nb. II; (1929); p. 2556 View in Reaxys


Rx-ID: 5012423 [View in Reaxys](#) 40/63

Yield	Conditions & References
68 %	With dihydrogen peroxide, potassium hydrogencarbonate in methanol, water, Time= 24h, Ambient temperature, other olefins, other reagents: H₂O₂/Na₃PO₄*12H₂O, H₂O₂/Amberlite IRC-50, H₂O₂-Na₂CO₃, H₂O₂/p-TsOH, H₂O₂/HCl, dicyclohexylcarbodiimide absence with presence of other reagents: m-CPBA, H₂O₂/KHCO₃/C₆H₅CN, other solvents, other reaction temperature and time, Mechanism Majetich, George; Hicks, Rodgers; Sun, Guang-ri; McGill, Patrick; Journal of Organic Chemistry; vol. 63; nb. 8; (1998); p. 2564 - 2573 View in Reaxys


Rx-ID: 29409868 [View in Reaxys](#) 41/63

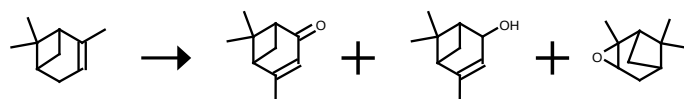
Yield	Conditions & References
93 % Chromat.	With ϵ-caprolactone, dipotassium hydrogenphosphate, dihydrogen peroxide in water, Time= 6h, T= 30 °C , Enzymatic reaction, Kinetics, Time Xu, Yi; Khaw, Na Ranong Bo Jian; Li, Zhi; Green Chemistry; vol. 11; nb. 12; (2009); p. 2047 - 2051 View in Reaxys


Rx-ID: 29744421 [View in Reaxys](#) 42/63

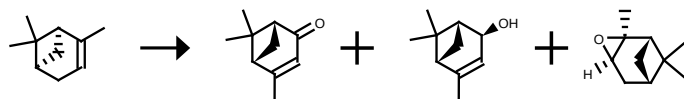
Yield	Conditions & References
	With 12-molybdophosphoric acid, potassium <i>tert</i>-butylate, oxygen in dimethyl sulfoxide, Time= 20h, Heating Liu, Chang-Hui; Li, Fei; Tang, Rui-Ren; Bulletin of the Korean Chemical Society; vol. 31; nb. 6; (2010); p. 1723 - 1725 View in Reaxys


Rx-ID: 2057124 [View in Reaxys](#) 43/63

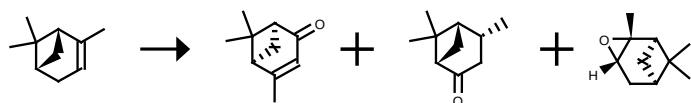
Yield	Conditions & References
5.0 % Turnov., 5.8 % Turnov.	Time= 24h, T= 25 °C , cell suspension culture of <i>Nicotiana tabacum</i> Hirata, Toshifumi; Ikeda, Yoshihiro; Izumi, Shunsuke; Shimoda, Kei; Hamada, Hiroki; Kawamura, Toshinari; Phytochemistry (Elsevier); vol. 37; nb. 2; (1994); p. 401 - 404 View in Reaxys
5.8 % Turnov., 5.0 % Turnov.	Time= 24h, T= 25 °C , cell suspension culture of <i>Nicotiana tabacum</i> Hirata, Toshifumi; Ikeda, Yoshihiro; Izumi, Shunsuke; Shimoda, Kei; Hamada, Hiroki; Kawamura, Toshinari; Phytochemistry (Elsevier); vol. 37; nb. 2; (1994); p. 401 - 404 View in Reaxys


Rx-ID: 5070099 [View in Reaxys](#) 44/63

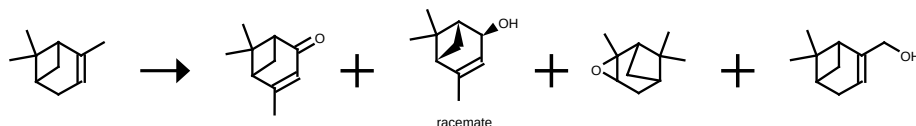
Yield	Conditions & References
	With oxygen, Co(4-picoline)2Cl₂, Time= 4h, T= 65 °C , Oxidation Rothenberg, Gadi; Yatziv, Yael; Sasson, Yoel; Tetrahedron; vol. 54; nb. 3-4; (1998); p. 593 - 598 View in Reaxys
	With oxygen, CoCl₂(α-picoline)₂, T= 50 °C , Kinetics, Product distribution, Further Variations: Catalysts Men'shikov, S. Yu.; Sennikov, M. Yu.; Romanova, Yu. V.; Sycheva, N. S.; Ostroushko, A. A.; Russian Journal of Organic Chemistry; vol. 40; nb. 6; (2004); p. 790 - 794; Zhurnal Organicheskoi Khimii; vol. 40; nb. 6; (2004); p. 830 - 833

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 Rx-ID: 9131342 [View in Reaxys](#) 45/63

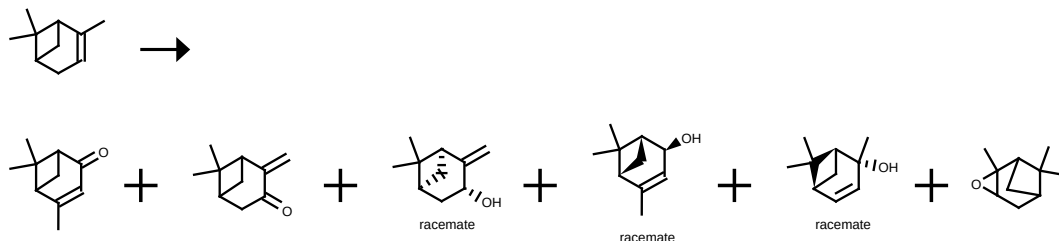
Yield	Conditions & References
50 % Chromat., 36 % Chromat., 10 % Chromat.	With 4-(tert-butyl)pyridine, sodium hypochlorite, N-tetradecyl-N-benzyl-N,N-dimethylammonium chloride, [Mn(III)(TMP)Cl], T= 20 °C , Product distribution, Further Variations: Catalysts, Reagents Maraval, Valerie; Ancel, Jean-Erick; Meunier, Bernard; Journal of Catalysis; vol. 206; nb. 2; (2002); p. 349 - 357 View in Reaxys


 Rx-ID: 2009844 [View in Reaxys](#) 46/63

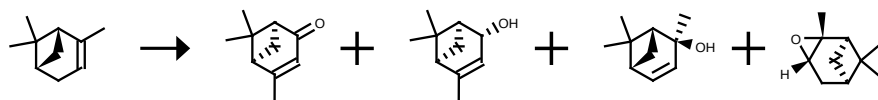
Yield	Conditions & References
2.8 % Turnov., 6.8 % Turnov.	Time= 24h, T= 25 °C , cell suspension culture of Nicotiana tabacum Hirata, Toshifumi; Ikeda, Yoshihiro; Izumi, Shunsuke; Shimoda, Kei; Hamada, Hiroki; Kawamura, Toshinari; Phytochemistry (Elsevier); vol. 37; nb. 2; (1994); p. 401 - 404 View in Reaxys
6.8 % Turnov., 2.8 % Turnov.	Time= 24h, T= 25 °C , cell suspension culture of Nicotiana tabacum Hirata, Toshifumi; Ikeda, Yoshihiro; Izumi, Shunsuke; Shimoda, Kei; Hamada, Hiroki; Kawamura, Toshinari; Phytochemistry (Elsevier); vol. 37; nb. 2; (1994); p. 401 - 404 View in Reaxys


 Rx-ID: 5261517 [View in Reaxys](#) 47/63

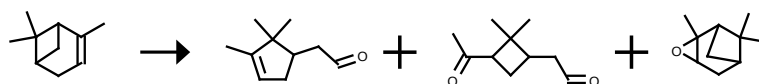
Yield	Conditions & References
17 % Chromat., 33 % Chromat., 24 % Chromat., 18 % Chromat.	With oxygen, tetraphenylporphyrin iron(III) chloride in toluene, Time= 8h, T= 20 °C , Irradiation, Oxidation, Product distribution, Kinetics, Further Variations: Catalysts, Solvents, Temperatures, ratio Hennig, Horst; Lupp, Doritt; Journal fuer Praktische Chemie (Weinheim, Germany); vol. 341; nb. 8; (1999); p. 757 - 767 View in Reaxys


 Rx-ID: 4154328 [View in Reaxys](#) 48/63

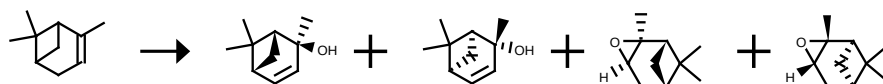
Yield	Conditions & References
	With oxygen, manganese(III)porphyrinate in water, acetone, Time= 4h, T= 40 °C , Irradiation, further catalysts and cycloalkenes; various concentrations; also with H₂O₂, benzoic acid, potassium formate and 1-methylimidazole, Product distribution Hennig, Horst; Behling, Joerdis; Meusinger, Reinhard; Weber, Lutz; Chemische Berichte; vol. 128; nb. 3; (1995); p. 229 - 234 View in Reaxys


Rx-ID: 8678620 [View in Reaxys](#) 49/63

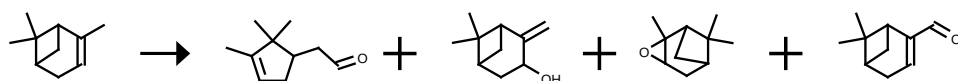
Yield	Conditions & References
	With oxygen, Co(4-Me(C₅H₄N))₂Br₂, T= 100 °C , Oxidation, epoxidation, Product distribution, Further Variations: Catalysts, Solvents, Temperatures, Reagents Lajunen, Marja K.; Maunula, Tatja K.; Koskinen, Ari M. P.; Tetrahedron; vol. 56; nb. 41; (2000); p. 8167 - 8172 View in Reaxys


Rx-ID: 4929003 [View in Reaxys](#) 50/63

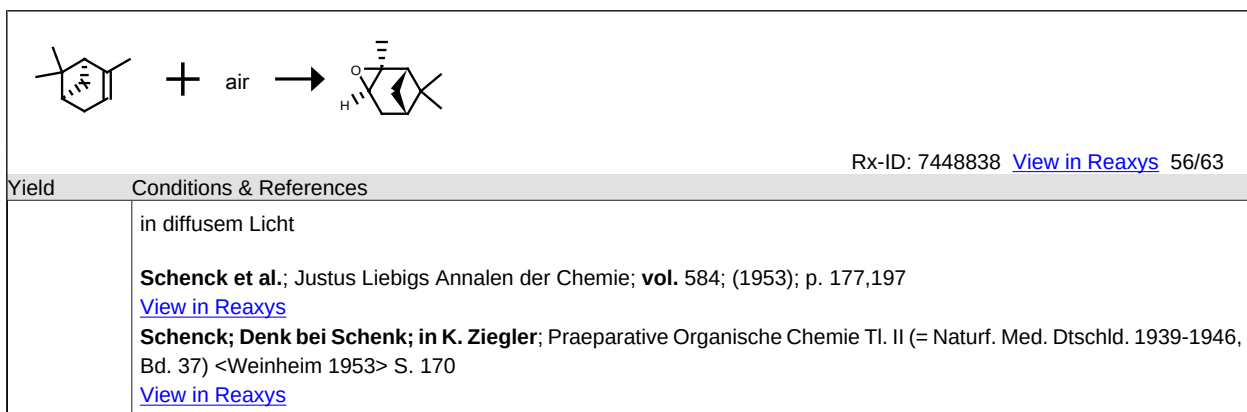
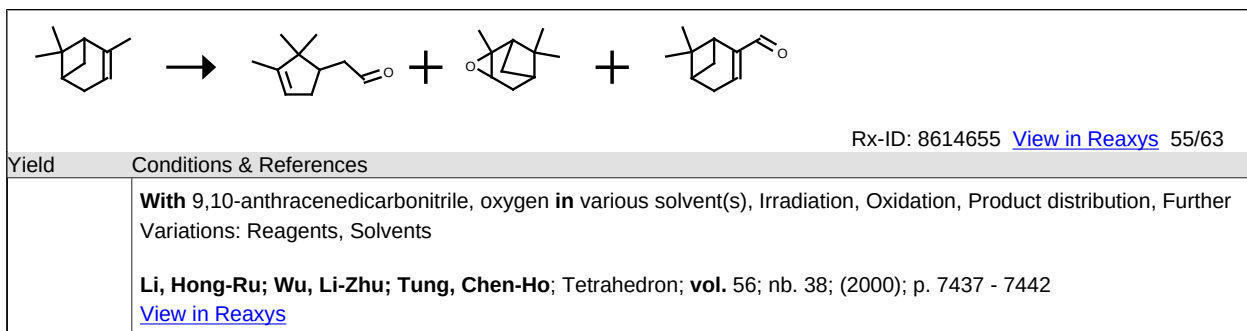
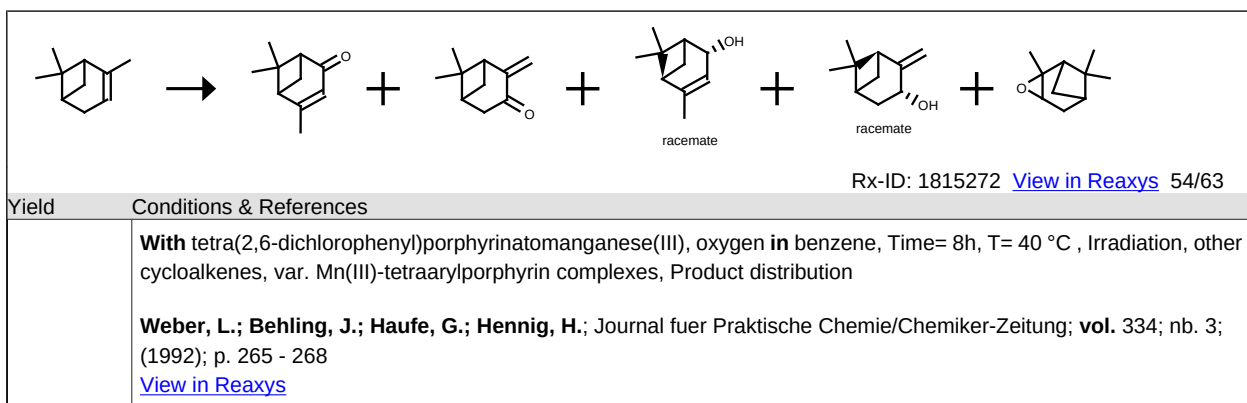
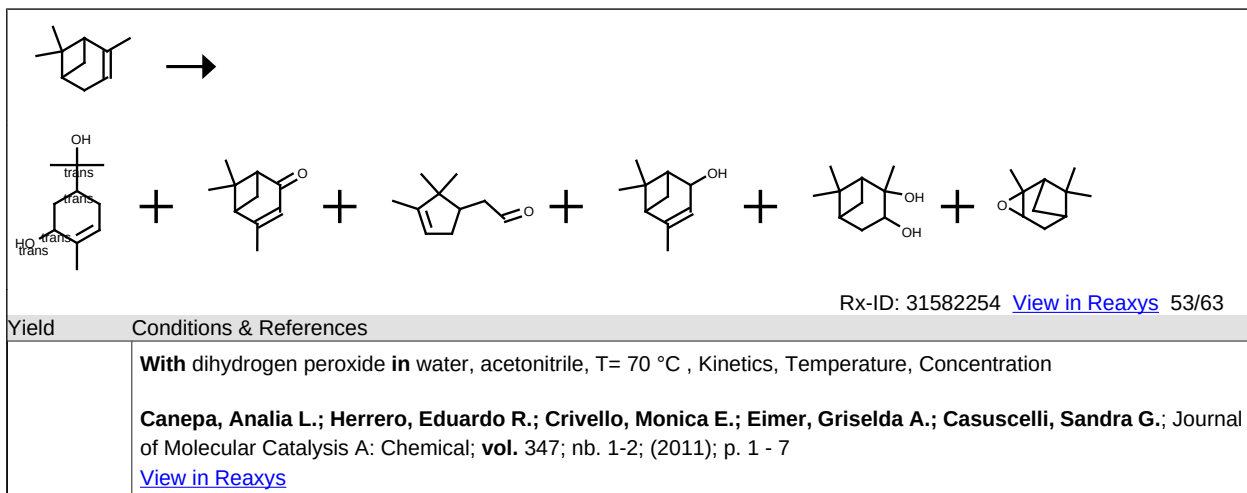
Yield	Conditions & References
	With oxygen, nitrogen trioxide, T= 24.9 °C , p= 15.001 - 150.01Torr , reaction in gas-phase; effect of NO, Product distribution, Mechanism Berndt, Torsten; Boege, Olaf; Journal of the Chemical Society, Faraday Transactions; vol. 93; nb. 17; (1997); p. 3021 - 3028 View in Reaxys

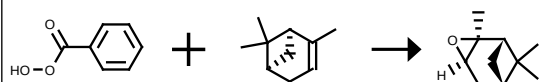

Rx-ID: 1815273 [View in Reaxys](#) 51/63

Yield	Conditions & References
	With 2,6-permethylated β-cyclodextrin-linked manganese porphyrin, oxygen in benzene, Time= 8h, T= 25 °C , Irradiation, other cyclodextrin-linked porphyrin - iron or manganese complexes, var. solvents, Product distribution Weber, Lutz; Imiolczyk, Ines; Haufe, Guenter; Rehorek, Detlef; Hennig, Horst; Journal of the Chemical Society, Chemical Communications; nb. 4; (1992); p. 301 - 303 View in Reaxys


Rx-ID: 8614656 [View in Reaxys](#) 52/63

Yield	Conditions & References
	With 9,10-anthracenedicarbonitrile, oxygen in acetonitrile, Irradiation, Oxidation, Product distribution, Further Variations: Solvents Li, Hong Ru; Wu, Li Zhu; Tung, Chen Ho; Chemical Communications (Cambridge, United Kingdom); nb. 12; (2000); p. 1085 - 1086

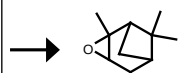
[View in Reaxys](#)



Rx-ID: 103459 [View in Reaxys](#) 57/63

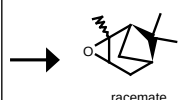
Yield	Conditions & References
	Delaby; Billuart ; Bulletin de la Societe Chimique de France; vol. <5> 10; (1943); p. 567,572 View in Reaxys


Rx-ID: 63451 [View in Reaxys](#) 58/63

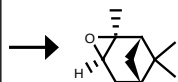
Yield	Conditions & References
	Arbusow; Michailow ; Journal fuer Praktische Chemie (Leipzig); vol. <2> 127; (1930); p. 1,8; Zhurnal Russkago Fiziko-Khimicheskago Obshchestva; vol. 62; (1930); p. 607,611, 613 View in Reaxys


Rx-ID: 5704019 [View in Reaxys](#) 59/63

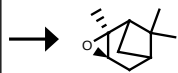
Yield	Conditions & References
	Crandall; Chang ; Journal of Organic Chemistry; vol. 32; (1967); p. 435,438 View in Reaxys Kropf; Yazdanbakhch ; Synthesis; (1977); p. 711 View in Reaxys De Pascual Teresa et al. ; Anales de Quimica (1968-1979); vol. 72; (1976); p. 181 View in Reaxys Poplawskaya; Gorjaew ; J. Gen. Chem. USSR (Engl. Transl.); vol. 33; (1963); p. 1495,1459 View in Reaxys Tolstikov et al. ; Zhurnal Organicheskoi Khimii; vol. 8; (1972); p. 1190,1204,1207 View in Reaxys
	Example Name 6 Example Title Continuous Rearrangement of α-Pinene Oxide into α-Campholenic Aldehyde in N-Butyl Benzoate Example 6 Continuous Rearrangement of α-Pinene Oxide into α-Campholenic Aldehyde in N-Butyl Benzoate Zinc bromide (24 g, 0.1066 mole) was dissolved in 1000 g of n-butyl benzoate, and the resulting solution was charged in the reactor shown on (in the 5-liter flask 1). Then, the reaction was carried out as in example 1, with the exception that the feed consisted of 98percent purity α-pinene oxide, without a compensatory solvent. Patent; Kane, Bernard J.; Sanders, Gary P.; Snow, Joe W.; Erman, Mark B.; US2002/169343; (2002); (A1) English View in Reaxys


Rx-ID: 8487155 [View in Reaxys](#) 60/63

Yield	Conditions & References
	α -Pinen, Monoperphthalsaeure Berson, J.A. et al. ; Journal of the American Chemical Society; vol. 84; (1962); p. 3337 - 3348 View in Reaxys


Rx-ID: 5704020 [View in Reaxys](#) 61/63

Yield	Conditions & References
	(+)- α -Pinen, Ox. mit CH ₃ COO ₂ H Boyle, P.H. et al. ; Journal of the Chemical Society [Section] C: Organic; (1971); p. 2136 - 2142 View in Reaxys
	α -Pinen, m-Cl-C ₆ H ₄ -CO ₃ H (s. note 5) Crandall; Crawley ; Organic Syntheses; vol. 53; (1973); p. 17 View in Reaxys
	(+)- α -Pinen, Perbenzoesaeure Myslinski, E. ; Roczniki Chemii; vol. 47; (1973); p. 1755 - 1758 View in Reaxys


Rx-ID: 6501733 [View in Reaxys](#) 62/63

Yield	Conditions & References
	α -Pinen, tert.-Amylhydroperoxid (TAHP) Yur'ev et al. ; Bulletin of the Academy of Sciences of the USSR, Division of Chemical Science (English Translation); vol. 23; (1974); p. 885,886; Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya; vol. 23; (1974); p. 919 View in Reaxys
	α -Pinen, Perbenzoesaeure Yur'ev et al. ; Bulletin of the Academy of Sciences of the USSR, Division of Chemical Science (English Translation); vol. 23; (1974); p. 885,886; Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya; vol. 23; (1974); p. 919 View in Reaxys


Rx-ID: 8211725 [View in Reaxys](#) 63/63

Yield	Conditions & References
	Δ eines Praep. von unbekanntem opt. Drehungsvermoegen mit LiAlH ₄ , Hexan, Cyclohexan oder Benzol -> trans-Pino-carveol, Borneol, Campholenalkohol (2-(2,2,3-Trimethyl-cyclopent-3-enyl)ethanol-(1)) Chretien-Bessiere et al. ; Bulletin de la Societe Chimique de France; (1963); p. 2546 View in Reaxys